



Safety Topic of the Month

Air Monitoring

Richmond Refinery

January 2011



Outline

Purpose of Air Monitoring

Types of Air Monitoring

Community Monitoring

Occupational Hygiene Update

Why do we do air monitoring?

- Because we care!
- Ensure engineering controls and PPE Requirements are sufficient for the work being performed
- To ensure the level of chemical hazards are low enough to perform work safely
- Legal Requirements
 - California OSHA requires monitoring to prove that over exposure does not occur with specific hazards such as asbestos, benzene, and many others. OSHA also requires monitoring to prove that the engineering controls and PPE requirements for a job were sufficient for the work being done.

What's the worst that could happen?

- If air is not properly tested prior to work:
 - Toxic atmosphere created by sludge left in vessel may result in explosive or deadly conditions
 - An oxygen deficient atmosphere may cause you to lose consciousness and asphyxiate.
 - Regularly changing demister pads that have high concentrations of benzene without the proper respirator can cause long-term health effects



Types of Air Monitoring

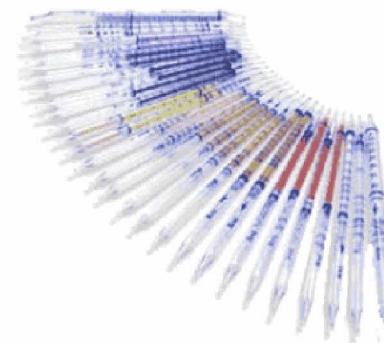
- **Electrochemical:** As a specific gas enters the detector, it reacts with the sensor and produces a current.

- Examples: iTXs, Personal H₂S Monitors (Yellow Canaries), etc.
- Drawbacks: Cross Sensitivities – It's important to understand that certain chemicals may cause false positives (example: SO₂ can give a false positive for H₂S); May be oversaturated by extremely high concentrations



- **Colorimetric:** A specific gas enters the tube and reacts with the chemicals inside, changing the color on a scale.

- Examples: Dräger tubes
- Drawbacks: Accuracy – Used mostly for process; Cross Sensitivities; One time usage; Must choose correct concentration range



Type of Air Monitoring

- Ionization Detectors: Use light or flame to break off electrons and sense concentrations

- Examples: Benzene detectors, VOC detectors
- Drawbacks: Equipment is much more fragile, susceptible to dirt



- Passive Monitoring: Air naturally flows through filter/media

- Examples: Passive badges used for hydrocarbon monitoring
- Drawbacks: Must be sent to laboratory for analysis





OE Occupational Hygiene Monitoring

- Finding out what each person is potentially exposed to on the job and monitoring to determine actual exposure.
- The OE Occupational Hygiene Process is designed to provide a global standardized process to enable Chevron to maintain and monitor the health of its workforce by identifying, quantifying, and controlling exposure to environmental agents.
- Completed:
 - Hydroprocessing
 - D & R
- Implementation Plan:
 - 2011 – Cracking
 - 2012 – B&S/U&E
 - 2013 – Maintenance

Community Monitoring

- When refinery operations have the potential to cause an off-site impact, members of HES dept. perform air monitoring around the perimeter of the refinery to determine if the surrounding communities will be affected.
- Substances monitored are dependent upon the release. Examples include:
 - Sulfurs (Hydrogen sulfide, Sulfur dioxide)
 - Hydrocarbons (Benzene, Toluene, Ethyl benzene, Xylene, etc.)





Closed Near Loss/ Near Miss (12/1/10-12/31/10)

Loss/Near Loss ID	Date Occurred	Division 9	Short Description	Immediate Corrective Actions Taken	Potential Severity Classification	Location of Loss/Near Loss
3546	12/5/10	Hydro - C Crew	Stripper Water product Off-test	Routed OFF-test to 13 sep and N. Iso stopped wash water. Cut Feed to 8 plant per V-801/P-801 limit.	Level 1	Rich Hydroprocess S Iso 8 Plant Sour H2O Plant
3710	12/7/10	Cracking General support	Lifted PRD on C-170 to Relief - Tripped Totalizer	Steam source removed from reboiler and level in column restored to normal. Blocked in additional block valve to ensure no leak by.	Level 1	Rich Crack FCC SGRU
4025	12/13/10	Cracking - B Crew	Two minor flaring events during start-up	Control board operator heated up C-160 to reduce the concentration of light products in the over head which reduced the unit pressure. A similar event also occurred at 1:22 AM and the same procedure was used to reduce flow to flare	Level 1	Rich Crack FCC Other (FCC)
4379	12/18/10	B&S - A Crew	Blend motors F-1 and F-2 taken off line. Could not keep fuel to line side of motors	Both motors were taken off line and estimated values were used to complete the blend.	Level 1	Rich B&S Pump Stations #17 Pump Station
4526	12/21/10	ACIG Group	Since 2001, Permit Conditions not met for FCC Plant 8-18 Components'	These FCC components will now be included in the LDAR db for quarterly inspections. Additionally, these components will be inspected before this year's end to bring the refinery in compliance for this 4th Q, 2010.	Level 1	Rich Refinery Gen
4668	12/23/10	Hazardous Waste Group	Internal odor complaint tracked down by Plant Protection to the WDS area.	Vacuum truck onsite had not started dropping yet and was told to return to North Yard Chem Pad area and not to offload. B&S contacted by PP to turn on deodorizers, 20 GA liquid alive used in WDS area to clean up odors, & area hosed down to clean drains.	Level 1	Rich U&E Haz Waste Section Wash Down Area
4847	12/28/10	Personal Protective Services	The safety latch which holds Gate 101 in the open position is missing.	A temporary tie strap is being used to hold the gate in the open position while the train is passing.	Level 1	Rich Plant Protection Other

Report Near Losses Anonymously! Click here



Review TOP Lessons Learned

Learning from our past incidents will help us prevent them in the future. Please take a few minutes now to review the TOP lessons learned.

TOP Lessons Learned